CONSTRAINT PROPAGATION IN FLEXIBLE MANUFACTURING pdf

1: Search Books www.enganchecubano.com

Constraint Propagation in Flexible Manufacturing: Volume and millions of other books are available for Amazon Kindle. Learn more Enter your mobile number or email address below and we'll send you a link to download the free Kindle App.

Embodiments of the system allow the propagation of constraints to be tuned to the semantics of each constraint, the likelihood of significant variable domain reduction, and other problem specific properties. The constraint propagation system is capable of being used as part of a reconfigurable search engine. Provisional Patent Application No. Field of the Disclosure The present disclosure relates to search engines for solving combinatorial optimization problems, and more particularly, relates to computer-implemented methods and software architectures for implementing constraint propagation and retraction algorithms. Description of the Related Art Constraint Programming CP methods are applicable to solving hard combinatorial optimization problems such as scheduling, planning, configuration, routing, resource allocation, timetabling, and rostering. Constraint propagation, which is a central technology employed in many CP systems, uses the constraints defined in a given problem model to greatly reduce the size of the search space that is searched to find solutions to a combinatorial optimization problem. Since the size of the search space for combinatorial problems is generally exponential in the size of the problem e. An effective approach for speeding up search is to reduce the search space as much as possible after every step of the search. Constraint propagation enforces a certain level of constraint consistency that results in a smaller search space. Typically in constraint programming, constraint propagation is intermixed with a search method that is used to derive new constraints. These new constraints are then propagated by the constraint propagation algorithm. The intended result is to reduce the search space as the search method explores those regions of the search space which remain after constraint propagation. Accordingly, a search must still be performed to find actual feasible solutions from within the reduced search space. Arc-consistency defined for constraints that involve more than two variables is called generalized arc-consistency. Alternatively, the global propagation loop is driven by domain reductions variable-centered. Traditional monotonic constraint propagation such as arc-consistency and its variants is an important part of a CP system, and well-understood and efficient algorithms are known see, e. Monotonic constraint methods typically remove values from the domains of variables that do not satisfy the constraints on these variables. Non-monotonic constraint propagation methods, like monotonic constraint propagation methods, can remove values that do not satisfy the constraints. However, unlike monotonic methods, non-monotonic methods are also able to put back values into variable domains if the constraints on those variables are retracted. Non-monotonic constraint propagation is less well developed, and the complexity of non-monotonic algorithms generally is greater than monotonic constraint propagation algorithms. Constraint retraction is a widely used technique in non-monotonic constraint propagation methods. Constraint retraction may occur in a search during backtracking and user interaction and in dynamic problems. If a constraint is retracted, domain reduction that has occurred directly or indirectly due to the presence of the retracted constraint is undone by the system. Different dynamic constraint retraction algorithms have different implementation difficulty, memory requirements, and running efficiency see, e. Each algorithm has particular advantages and disadvantages and can be selected for use by the constraint propagation engine to suit specific requirements of a combinatorial optimization application. During propagation, each time a variable domain is reduced called a variable event , the constraints involving that variable are processed, and in turn, these constraints generate new variable events thus removing more values from the domains of their argument variables. At run-time, this life-cycle can stop at the domain modification step if the event does not add new information to the current status of the domain i. When a constraint is awakened, it can either be immediately propagated or delayed until all variable events have been processed. Thus propagation can be either variable-directed or constraint-directed. There are different strategies for performing constraint propagation. For example, in a Depth-First Search, when a variable event is executed, all children variable events resulting from the constraint propagation are propagated before other pending variable events. In contrast, in a Breadth-First Search, variable events are propagated by generation. The choice of the CP strategy will depend on the combinatorial optimization application. The order of propagation then is defined as follows: Since global constraints are often awakened after several variable events have occurred, such constraints need to take a global view of what has changed; hence global constraints consider the changes as an abstract event e. Some global constraints have special abstract events which contain more detailed information. Previous constraint programming systems have selected a particular constraint propagation architecture and have hardwired it into a search engine also known as a reasoning engine. Some systems use constraint-centered methods and others use variable-centered methods. Naive implementations of the CP architecture may be very inefficient. Recent work on the CHOCO constraint programming system takes some advantage of propagating constraints in an intelligent order depending on their domain reduction power see, e. Researchers have studied the effectiveness of implementing different constraint propagation strategies see, e. When new propagation strategies are added, the internal code of the search engine at the very lowest levels must be reprogrammed. In addition, the behavior of all constraints in CHOCO needed to be specialized in order to add explanation computation code and to add a method that provides an explanation for every domain modification that the constraint performs. For example, embodiments of the system support a variety of constraint propagation and retraction algorithms that can depend on the needs of the application at hand. In some embodiments, the constraint propagation system supports an efficient, non-monotonic flexible constraint propagation engine. Non-monotonic constraint propagation methods, which may be used for dynamic constraint optimization problems COPs and Mixed-Initiative MI applications, may be implemented with the constraint propagation system. The constraint propagation system disclosed herein is capable of being used with a reconfigurable search engine. The constraint propagation system may provide other benefits as well. An embodiment of a constraint propagation system for use with a search engine configured to search for solutions to a combinatorial optimization problem is disclosed. The system comprises a constraint system configured to store in a computer memory information related to at least one constraint of a combinatorial optimization problem and to provide at least one message related to the at least one constraint. The message comprises at least one of an add constraint message and a retract constraint message. The combinatorial optimization problem comprises variables and constraints that specify a relationship among one or more of the variables. The constraint propagation system also comprises a propagator system configured to receive the at least one message from the constraint system and to execute, in a computer processor, constraint propagation instructions in response to the received message. The constraint propagation instructions include instructions for processing at least one of a variable event and a constraint event. A variable event represents a change to a value or a domain of a variable, and a constraint event represents a change to a value or a domain of a variable associated with the constraint. An embodiment of a method for constraint propagation in a search engine configured to search for a solution of a combinatorial optimization problem is disclosed. The constraint propagation method comprises communicating to a propagation processor information relating to an event associated with a solution of a combinatorial optimization problem. The event comprises at least one of a variable event and a constraint event. The method also comprises, in response to the information, executing instructions related to the event by the propagation processor, wherein the instructions comprise at least one of variable event instructions and constraint event instructions. A computer-readable medium may comprise computer-executable instructions embodying the method. An embodiment of a computer-implemented method for configuring a constraint propagation engine comprises receiving combinatorial optimization problem COP information relating to a COP model. The method further comprises receiving a performance benchmark relating to a constraint propagation method that is usable with a search engine configured to search for a solution to the COP model. The method also comprises configuring a constraint propagation engine for use with the search engine using at least the COP information and the performance benchmark. An embodiment of a search engine is provided that comprises a constraint propagation engine configured according to the method. Neither this summary nor the following detailed description of preferred embodiments is intended to limit the scope of the disclosed invention. The invention is defined by the claims and their equivalents. Reference symbols are used in the figures to indicate certain components, features, and aspects shown therein, with reference symbols common to more than one figure generally indicating like components, features, or aspects. These drawings and description of the disclosed embodiments are presented by way of example only, and do not limit the scope of the invention, which extends to alternative embodiments and uses of the invention and to obvious modifications and equivalents thereof. Thus, the scope of the invention is not to be limited to the preferred embodiments described below. Also, for purposes of contrasting different embodiments and the prior art, certain aspects and advantages of these embodiments are described herein where appropriate. It should be understood that not necessarily all such aspects and advantages need be achieved in any one embodiment. Thus, it should be recognized that certain embodiments may be carried out in a manner that achieves or optimizes one advantage or group of advantages without necessarily achieving other aspects or advantages that may be taught or suggested herein. As will be apparent, the disclosed constraint propagation systems and methods are not limited to the Reconfigurable Search Engine shown, but rather are applicable to a wide range of other search engine systems, including systems that are capable of using only a particular type of search method. A mathematical model of a combinatorial optimization problem COP is a formulation of the variables, constraints, and optionally one or more objectives to be optimized. A solution for the COP problem may be found by searching a search space to determine allowed values of the variables that satisfy the constraints and optionally that optimize the objectives. A solution is represented by Answers The Search Engine Instance is compiled from the library of Reconfigurable Components so as to implement one or more suitable search methods. The Constraint Store comprises a network of constraints and variables compiled by the Problem Model Compiler The network of constraints and variables in the Constraint Store may be compiled using data structures compatible with the internal algorithms of the Search Engine Instance The Search Engine Instance is then run e. In some embodiments, the COP Model is represented in a suitable syntactic format such as, for example, an extensible markup language XML document. XML advantageously provides the ability to accurately describe very complex relationships among the variables, constraints, and objectives which appear in scheduling, planning, configuration and other COPs. Alternatively, a customized input language can be defined for a specific application of the Reconfigurable Search Engine The Answers may also be represented in a suitable syntactic format such as, for example, XML. The Reconfigurable Search Engine does not require XML format, and many other suitable input data representations may be used. For example, the Answers may be displayed in a graphical user interface or used as an input to some other output or display system. The Reconfigurable Search Engine may be used to solve a COP using one or more search methods, including the search methods described above such as, for example, constructive search methods, hybrid search methods, or a combination thereof. The components in the library may be precompiled. A complete representation of the Search Engine Instance is assembled from this component library for the type of COP being solved. Thus the Reconfigurable Search Engine can easily be extended and the new components reused in other applications. In some embodiments, the Problem Model Compiler assembles the Search Engine Instance and the Constraint Store in a semi-automated manner with relatively minimal input from the user. An advantage of such embodiments is that the user does need not to understand the details of the assembled components or the internal representation of the Constraint Store Because the Problem Model Compiler substantially handles the compilation of components needed to find the Answers , users not versed in the art of constraint programming beneficially can use the Reconfigurable Search Engine to solve difficult COPs and to build customized applications using, e. The Reconfigurable Search Engine may provide a broad spectrum of user control over the compilation process. Alternatively, in a custom embodiment or mode, the user may specify one or more desired search methods and components from the library of Reconfigurable Components to create the Search Engine Instance And in an expert embodiment or mode, the user may add new components to the library of Reconfigurable Components using the API provided so as to implement a novel Search Engine Instance These embodiments and modes are intended as examples only and are not intended to limit the range of possible user control over the compilation process. For example, certain COP Model types can be specified as an asset scheduling management problem ASM , which typically describes a process of controlling utilization of assets in a production chain to provide improved or maximal support for organizational goals. Asset scheduling management problems include, but are not limited to, enterprise asset management problems, computerized maintenance management system problems, supply chain planning problems, and enterprise resource planning problems.

2: Constraint Management In Manufacturing | Download eBook PDF/EPUB

According to Askin and Standridge, "the purpose ofmanufacturing, at least idealistically, is to enrich society through the production of functionally deÂ- sirable, aesthetically pleasing, environmentally safe, economically affordable, highly reliable, top-quality products" [AS93].

Constraint Management in Manufacturing: Optimising the Global Supply Chain is for both practitioners and researchers alike. It is an instructional tool for anyone teaching operations management and related subjects, and is a valuable guide for those striving to improve the performance of their own companies. The text addresses the increasing demand for manufacturing approaches that apply constraint management and link it to the creative use of new technologies, including the Internet. A new approach to improving the production of goods and services, Constraints Management CM , recognizes the powerful role of the constraint the limiting resource in determining the output of the entire production system. Victoria J Mabin Language: Eliyahu Goldratt - has seen a rapid expansion since the publication of his book, The Goal. As with most fast growing areas, you can quickly feel out of touch with new developments. The authors explored databases, and sought out papers and books drawing on as wide a range as possible. Aside from the works by Dr. Goldratt himself, the authors focus on items published since , highlighting the most recent developments in TOC. The scope of the material covers works containing specific reference to TOC, including Synchronous Manufacturing and Constraint Management. The book is organized into three sections. The first section contains an analysis and interpretation of the results of the search. The second provides abstracts on all the material. The third supplies author, keyword, and subject indexes along with a list of books, journals, websites, and publishers. The multi-search approach has made this arguably the most exhaustive bibliography on this subject available. If you are researching TOC, this is the best place to start. If you use or teach TOC, you will want this resource. An information systems trailblazer in the domains of decision support and factory and supply chain synchronization, the second edition of Re-Engineering the Manufacturing System stays true to its title, once again bestowing uniquely straightforward instructions for designing, installing, and operating manufacturing information systems. This updated and expanded source takes care to clarify the often blurred concepts of synchronization and optimization and offers implementation advice from four discrete angles to yield better bottom-line results. It shows how to exploit an information system, rolling ERP system implementation into the TOC framework to promote profit materialization. Praise for Throughput Accounting: A Guide to Constraint Management "Throughput Accounting provides managers with a fresh set of eyes to identify and control bottlenecks. The drum, buffer, and rope will become part of the cost accounting lexicon in the future. Steven Bragg has introduced us to an accounting structure that will enhance our bottom line utilizing throughput accounting methodology. Stevens, President, LeanThinkingbyAccountants, LLC "A thought-provoking, insightful, and useful book that explains how older conventions of accounting can lead to poor management decisions. Instead of focusing on typical cost-cutting methods only, Mr. Bragg provides CFOs with a systemic approach on how to instead focus on maximizing profits and become better business partners. Japan "Throughput Accounting by Steve Bragg presents a new way to evaluate and apply the concepts of cost accounting with greater impact on operational efficiencies. An interesting, understandable, and useful guide for anyone who needs a valuable source of information and ideas relating to financial and accounting affairs. This groundbreaking book includes chapters covering financial analysis scenarios with case studies that show specifically how throughput accounting can be used to find the best solutions in a large number of real-world situations.

3: Constraint Propagation in Flexible Manufacturing: Vo () by Toan Phan Huy

Get this from a library! Constraint Propagation in Flexible Manufacturing. [ToÃ n Phan Huy] -- This book provides a thorough analysis of scheduling problems that arise in a flexible manufacturing environment with scarce resource supply.

CONSTRAINT PROPAGATION IN FLEXIBLE MANUFACTURING pdf

4: Constraint Propagation in Flexible Manufacturing - Huy ToÃ n Phan, Toan Phan Huy - Google Books

Constraint Propagation and the DSP. Huy, Dr. ToÃ n Phan. Pages

CONSTRAINT PROPAGATION IN FLEXIBLE MANUFACTURING pdf

New owners guide to papillons The Ideal cook book Americas Triumph at Panama How to start and succeed in a business of your own Lessons to Live by Awakening to the Heartbeat of God Partnering with your local historical society by Elaine Williams James patterson french twist United States v. Reynolds (1953) Social relations in our Southern States. Readings in the psychology of childhood and adolescence. To move the world Lower Colorado River national wildlife refuges comprehensive management plan, 1994-2014 Using our daily energy What is contingency theory A century of war william engdahl The letters of Theophilus Lindsey (1723-1808) Ecological restoration : from functional descriptions to normative prescriptions Andrew Light Subjunctive with certain conjunctions Human brain quiz with answers Family-centered care of children and adolescents Chemical Guide to the Osha Hazard and Communication Standard A catalogue of the Chinese translation of the Buddhist Tripitaka Customer-focused marketing of financial services Young Fashion Designers (Evergreen) V. 4. Oriental, Spanish, English, American and contemporary John Rich, theatrical regulation, and the dilemma of the commercial stage Matthew J. Kinservik Reuben Snake, Your Humble Serpent The 5 Minute Healer Cancer detection using image processing Group identities on French and British television The Second World War, Vol. 5 How did Stalin rule? The first book of baking Border Identities Concept formation A Students History Of English Literature Essentials of plastic surgery 2nd edition Head in the cloud Effective business report writing